

REMARKS

After entry of this amendment, claims 1 - 27 will be pending. No new matter has been added. Applicants kindly thank the Examiner for the telephonic interview on Nov. 22, 2005, during which claims 13-22 were discussed. New claims 23-27 relate to that discussion. In particular, it was noted that Applicants achieved a surprising result because their claimed composition maintained an unexpectedly high compressive strength even though it has undergone substantial expansion – a process known to diminish compressive strength. In keeping with the flow of the recent telephonic interview, claims 13-27 will be discussed first, followed by claims 1-12.

I. The Rejections Under 35 U.S.C. § 103

The Examiner rejected claims 1-2, 4-7, 11-14 and 16-19 under 35 U.S.C. §103 as obvious over Wycech (USP 5,755,486) in view of Anfuso (USP 5,086,080). The Examiner also rejected claims 3 and 15 under 35 U.S.C. §103 as obvious over Wycech in view of Anfuso and Kawasaki (USP 5,782,730). Moreover, the Examiner rejected claims 8-9 and 20-21 under 35 U.S.C. §103 as obvious over Wycech in view of Anfuso and Rowland (USP 4,692,475). Finally, the Examiner rejected claims 10 and 22 under 35 U.S.C. §103 as obvious over Wycech in view of Anfuso, Kawasaki, Rowland and Bagga (USP 5,021,513). These rejections, all of which require the combination of Wycech and Anfuso, are traversed.

II. Claims 13-27 Are Not Obvious**A. No Prima Facie Case Of Obviousness Has Been Established**

The rejection has not set forth a prima facie case of obviousness. Section 2142 of the MPEP explains the burden of stating a prima facie case of obviousness as follows:

The examiner bears the initial burden of factually supporting any prima facie conclusion of obviousness. If the examiner does not produce a prima facie case, the applicant is under no obligation to submit evidence of nonobviousness. . . .

To establish a prima facie case . . . three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference . . . must teach . . . all the claim limitations. The teaching . . . and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) (emphasis added).

1. The rejection did not set forth a proper motivation to combine references

The rejection states no motivation to combine Wycech and Anfuso. Neither does it point to any such motivation in the prior art. Instead, the rejection merely states that "Wycech teaches X but not Y; Anfuso teaches Y; therefore it would have been obvious to combine Wycech and Anfuso." This rationale is insufficient evidence of a motivation to combine.

First, it is important to note that Wycech teaches expanding foams having a certain strength. Wycech col. 4 line 28-51. The foam expands and adheres to sidewalls, but the expansion cannot be too great or the compressive strength would be diminished. As one of skill in the art would appreciate, too much expansion from expandable beads would make the final expandable resin more compressible – a result that Wycech teaches away from. Indeed, the one example in Wycech uses a very small percent of a blowing agent ~ 0.71% by weight.

There is no reason why one of skill in the art looking to improve on the foams of Wycech would turn to Anfuso. Anfuso teaches a method of making expandable beads. The purpose of Anfuso is to address the prior art problems of making such beads. Those problems included "unperfect and unacceptable diffusion of the expanding agent in the blend" of the beads. Anfuso col. 1, lines 65-67. Anfuso addresses this by adding expanding agent during the polymerization phase of a vinyl aromatic monomer in the presence of poly(phenylene-ether). *Id.* at col. 2, lines 14-18. The examples in Anfuso do not discuss the compressible strength of the beads after expansion. *Id.* at col. 5, lines 47-49 and col. 6 at lines 1 and 2.

Absent a discussion of compressive strength after expansion, there is no reason one of skill in the art looking to improve on the foams of Wycech would turn to Anfuso, and the combination of Wycech and Anfuso is present in all of the Examiner's rejections of claims 13-22.

2. The rejection did not set forth a reasonable expectation of success

Even if combined, one of skill in the art would not expect the combination of Wycech and Anfuso to succeed in producing a foam that expands to the extent claimed in claims 13-27 and that also has a compressive strength as claimed. This is because one of skill in the art knows that when a foam is expanded, it tends to lose compressive strength.

Thus, one of skill in the art would expect that a combination of Wycech and Anfuso would lead to a foam that either expanded as much as the foam in claims 13-27, or that had the strength of the foam in claims 13-27, **but not both**. None of the other cited references cure this deficiency.

3. The rejection does not show that the combination of references teaches all the claim limitations

The combination of Wycech and Anfuso does not teach a foam that has both the expansion percentage and the compressive strength found in claims 13-27. None of the other cited references cure this deficiency. Thus, there is no *prima facie* case of obviousness, and Applicants are under no obligation to come forth with evidence of unexpected results or synergism.

B. Even If A Prima Facie Case Of Obviousness Had Been Established, Applicants Have Overcome It

Applicants have come forward to evidence to show non-obviousness of claims 13-27. In particular, Applicants attach hereto a first declaration of Chin-Jui Chang, dated October 16, 2002. This declaration has previously been submitted in connection with this patent file history. In it, a Wycech composition was prepared, according to the teachings of Wycech. Chang Decl. I, ¶ 2. When tested, the Wycech composition demonstrated neither the claimed range of expansion after heating, nor the claimed compressive strength of claims 13-27. *Id.* at ¶ 3.

Anfuso does not overcome this deficiency, nor does any of the other cited art. If more expandable beads are added to the Wycech composition, the composition will experience greater expansion when heated. *But the compressive strength would be expected by one of skill in the art to be even lower than that of original Wycech composition.* This is significant because the original Wycech composition already had a compressive strength lower than the range required in the claims.

Thus, it is a surprising result that Applicants were able to achieve a composition that expanded to the extent claimed and that had compressive strength to the extent claimed in claims 13-27 of the present application. For at least this reason, claims 13-27 are allowable over the applied art. Applicants respectfully request that this rejection be withdrawn.

III. Claims 1-12 Are Not Obvious

Composition claims 1-12 require at least 20-30% SBS block co-polymer, 5-20% polystyrene, 0.5-5% rubber, and 30-45% epoxy resin. This synergistic combination of ingredients provides the unexpected result discussed above; thus, these claims are not obvious.

A. No Prima Facie Case Of Obviousness Has Been Established

The rejection of claims 1-12 does not meet the criteria to establish a prima facie case of obviousness under Section 2142 of the MPEP. It merely concludes that although the claimed combination requires an SBS block-co-polymer that is not present Wycech, the primary reference, it would have been obvious to turn to Anfuso to cure this deficiency. This is insufficient to satisfy the initial burden on the PTO.

1. The rejection did not set forth a proper motivation to combine references

The rejection does not state a reason, and there is no reason, why one of skill in the art who is looking to improve upon the foams of Wycech by the addition of an SBS block-co-polymer would turn to Anfuso, *which teaches a method of making expandable beads*. These references would not be combined as suggested by one of ordinary skill in the art, and this combination is required in every rejection of claims 1-12.

2. The rejection did not set forth a reasonable expectation of success

Even if combined, one of skill in the art would not expect the combination of Wycech and Anfuso to succeed in producing a foam such as the one of claims 1-12. The rejection provides no evidence that one of skill in the art would have expected that the addition of a certain amount of an SBS block co-polymer to the formulation of Wycech would have resulted in the claimed composition, which has unexpected properties such as simultaneous high compressive strength and high volumetric expansion.

3. The rejection does not show that the combination of references teaches all the claim limitations

The combination of Wycech and Anfuso do not teach a foam that has all the particular ingredients of the composition present in the claimed ranges. The particular ingredients and ranges are important in achieving unexpected properties of the claimed composition, such as simultaneous high compressive strength and high volumetric expansion.

B. Even If A Prima Facie Case Of Obviousness Had Been Established, Applicants Have Overcome It

If the burden has shifted to the Applicants to come forward with evidence to show the non-obviousness of claims 1-12, Applicants have done so herewith and previously in connection with this file history. The rejection stated in its 103 argument that Wycech did not teach the SBS block co-polymer but that it did disclose polyisoprene and that Anfuso teaches that polyisoprene is equivalent to SBS block co-polymer. Applicants traverse.

First, to address the rejection's allegation that polyisoprene is an "equivalent" of an SBS block co-polymer, Applicants gathered testimony to show that one of skill in the art would conclude otherwise. Specifically, Applicants attach hereto a second declaration of Chin-Jui Chang, dated October 16, 2002. This declaration has previously been submitted in connection with this patent file history. In it, Chang describes the vast structural and functional differences of polyisoprene and an SBS block co-polymer. Chang Decl. II, ¶¶ 2-3. Importantly, the SBS block co-polymer is unique because it is not chemically cross-linked. Thus, it can be processed and shaped more easily. Note the processing advantage described in the specification. When SBS block co-polymer is removed from the formulation, the ingredients cannot even be mixed. See Example 7 of the specification. Additionally, SBS block co-polymers have two phases – they are rubbery and fluid at high temperatures and hard and plastic at low temperatures – which makes them useful for structural foams. Chang Decl. II, ¶¶ 2-3. Polyisoprene lacks these characteristics. Id.

Second, the specification provides additional evidence that the particularly claimed ingredients, present in the particularly claimed amounts, provide a synergy that results in the unexpected properties of both high volumetric expansion and high compressive strength. For example, see Tables 5 and 6 and compare them with Examples 7 and 8. Tables 5 and 6 show the SBS block co-polymer (Fina Clear 530) in samples A – D in preferred ranges, and Table 6 shows the resultant expansion and compressive strength of those samples. All of these samples achieved the desired results.

Compare that to the situation where the SBS block co-polymer is removed, along with other rubber, as was done in Example 7. When this was attempted, the ingredients could not even be mixed. Note also that when SBR is added to the composition along with SBS, as was done in Example 8, the compressive strength of the overall composition

was reduced below the level claimed in several claims. This data collectively suggests that achieving a foam that has both a high expansion and a high compressive strength is difficult, and can be upset easily by tinkering with ingredients. One of skill in the art expects a composition can have one or the other, but not both.

Here, the right ingredients in the right amounts have a synergistic effect. They result in a composition that can be expanded by a significant amount without the expected substantial sacrificing of compressive strength. This is what Applicants have achieved in claims 1-12.

None of the various combinations of cited references, all of which require the principal combination of Wycech and Anfuso, teach or suggest the specific formulation of these claims. For at least this reason, claims 1-12 are allowable over the applied art. Applicants respectfully request that this rejection be withdrawn.

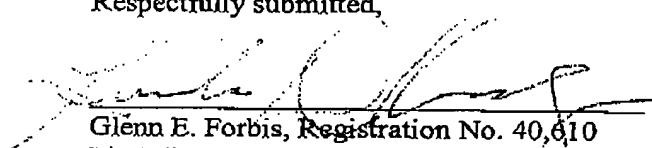
IV. CONCLUSION

For at least these reasons, this application is now in condition for allowance. It is believed that any additional fees due with respect to this paper have already been identified in any transmittal accompanying this paper.

However, if any additional fees are required in connection with the filing of this paper that are not identified in any accompanying transmittal, permission is given to charge account number 18-0013 in the name of Rader, Fishman and Grauer PLLC. If the Examiner has any questions or comments, she is kindly urged to call the undersigned to facilitate prosecution.

Respectfully submitted,

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